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# VHF/UHF – An Expanding World

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David Smith VK3HZ

## Weak Signal

David Smith - VK3HZ

As could be expected, the exceptional Sporadic E conditions over Christmas have now largely ended. However, we have had a couple of openings to finish things off.

Brian VK5BC reports: *On the 15 Jan at 6.50 pm SA time, I was fortunate to work three stations in Perth and Bob VK6BE in Albany on 2 m Sporadic E from Corny Point PF85mc. I worked Phil VK6ZKO 5/9, Cec VK6AO 5/8 and Peter VK6RZ 5/3 all in Perth - a distance of approx. 2000 km. About 1/2 hour later, I worked Bob VK6BE in Albany. I first heard the Perth 2 m beacon VK6RPH at S9 off the back of my yagis and made a quick call on 144.1 and worked Phil prior to turning the beams in the Perth direction. The Perth stations were workable over about a 5-minute period and although I heard other weak signals in the following 1/2 hour, none lasted long enough for a contact. A couple of other Perth stations also copied my signal - namely VK6RO and VK6AKT. I also heard the Bunbury 2m beacon VK6RBU up to S9 and a little later the Mt Barker 2m beacon VK6RST S5.*

Garry VK5ZK at Goolwa also worked VK6ZKO and VK6AO.

*This opening was the highlight for me of what has been an excellent 2 m Sporadic E season. I have recorded 2 m E openings on 9 separate days - the first on 7th Dec and the last one on 20th Jan and have worked over 50 stations during these openings. I have worked several VK4's from both my home QTH (Gawler PF95jj) and Corny Pt (PF85mc). Contacts have been made with John VK4FNQ in Charters Towers on 5 separate occasions.*

On 17 January at 0215Z, Rob VK1ZQR reported on the VK/ZL Logger that he was hearing the VK8RAS 2 m beacon at 5/1. Jeff VK8GF saw this message at work, and managed to work Rob using 100 W to a 5/8 vertical antenna. The opening – probably Sporadic E – lasted for 20 minutes.

On 19 January, Brian VK5BC again worked John VK4FNQ at Charters Towers on 2 m. John also worked Larry VK5LY in Renmark. Brian also heard Trevor VK4AFL in Brisbane.

On 25 January at 0930Z, Garry VK5ZK worked Rob VK4TWR at 5/5. Peter VK5ZLX also worked Rob. The openings were very brief – 20 second bursts – with Rob continuing to be heard sporadically for about 15 mins.

Moving on to Tropo enhancement, there have been many VK5 to VK3 to VK7 openings resulting from high-pressure cells moving across the region. Stations on the north coast of Tasmania (mainly Norm VK7AC, Paul VK7BBW and Karl VK7HDX) seem to be having a particularly good run working many times across Bass Strait well into VK3 and as far as Adelaide in VK5 on 2 m, 70 cm and 23 cm. On 17 January, Norm reports working ZL3MH, ZL3FV, ZL3AAU and ZL4DK on 2 m.

Rex, VK7MO has been exploring coastal ducting up the east coast from Tasmania with SSB contacts on 8 January on 2 m to Colin VK2KOL, Steve VK2ZT, Dave VK2AWD and Ross VK2DVZ; on 9 January to VK2DVZ, VK2ZT, and Neil VK2EI on 2 m and VK2ZT on 70 cm. The duct opened again on 15 January with SSB contacts to VK2EI on 2 m, VK2DVZ on 2 m, 70 cm and 23 cm - the 23 cm contact being a new VK7 record using CW. On 16 January, Rex reports a late season Sporadic E opening with SSB contacts to ZL3TY 5/9+ and ZL3FV and a tropo-ducting opening to ZL3TY using JT65 on both 2 m and 70 cm on 23 January. There was a further

coastal duct opening on 3 February to VK2DVZ on 2 m and Matt VK2DAG, on 2m and 70 cm. Rex uses the Newcastle channel 5a TV on 138.276 MHz as an indicator of the coastal duct.

On 4 February Rex completed a dual propagation mode tropo-ducting to meteor scatter 2327 km contact using FSK441 with Chris ZL2DX, 50 km East of Wellington. Chris is shielded from tropo-ducting by 1500 to 2000 metre high mountains on the north of the South Island and this is his first ever VK contact. Because of this shielding, it is necessary to use meteor scatter to cross the mountains and for the tropo-ducting extension of the path to be at the Tasmanian end. The duct was confirmed with 5/9 SSB signals to VK2ZT after the ZL contact. Rex is coming to the conclusion that dual propagation mode tropo-ducting to meteor scatter might be present most times there is a big yellow ducting patch indicated by the Hepburn charts at one end of a long 2000 km plus path with three examples so far this summer.

And in the "Close, But No Cigar" category, there have been a number of reports of beacons heard at good strength, but no stations around to contact.

John VK6JJ in Perth advises that, on the 2 February at about 0200Z, he heard the VK5VF 2 m beacon up to S9. He then called both on SSB & CW on 144.1 but unfortunately no contact was made.

On the morning of 3 February, ZL1IU reports hearing the VK3RGI (Gippsland) 2 m beacon up to S5. No contacts resulted.

For several days in early February, the VK6RST (Albany) beacons on 2 m and 70 cm were heard for extended periods and at good strength in VK5 and VK3. Once again, no stations could be raised.

Trevor VK5NC dropped me a note concerning the claim that the VK6 to VK7 2 m contact reported in the last column was the first ever between those two states. In February 1988, VK6AOM in Esperance had a 2-way SSB contact with VK7DC in Burnie, which is believed to be the first between VK6 and VK7.

### **Summer VHF/UHF Field Day**

For once, the weather, at least in VK3, was kind to participants in the field – neither blowing a gale, freezing, nor pouring with rain.

Chas VK3PY, David VK3QM and Charlie VK3NX were at Barabool Hills near Geelong operating as VK3UHF. Chas reports: *Highlights included working 18 grids on 2 m, 14 grids on 70 cm and 10 on 23 cm. Oh, and I mustn't forget the overseas contact to VK7 on 2 m! We also knocked over quite a few grids on the microwave bands, 2.4 GHz to 10 GHz, although we couldn't raise anybody on 24 GHz. Two 23 cm contacts stand out in my mind: VK3VHF in Gippsland, (about 150 km away), who was running 1W to a 60 cm dish and VK1CEA on Mt. Coree, who had 10W to a 1.2m dish, but no pre-amp. At the conclusion of the contest, we had a lengthy rag-chew with the latter - no aircraft enhancement required. Our 23cm system comprised 50W to a 42-el yagi with Minikits LNA.*

Colin VK5DK reports that the South East Radio Group operated in the 8-hour section on all bands from 50 MHz to 10 GHz. Greatest distance worked was to Ralph VK3WRE - just under 530 km - on 144 MHz, 432 MHz, 1296 MHz, 2403 MHz and 3400 MHz. Details are on the South East Radio Group web site: [serg.mountgambier.org](http://serg.mountgambier.org) then go to "Recent Happenings", "Current", then click on 2007 Field Day for all the photos and contact details.

Andy VK2AES reports: *We had a hoot of a time operating VK1CEA from Mt Coree*

over the weekend. The amount of activity seems to be increasing with every contest. Thanks to all of the home stations who gave us regular contacts. We barely had time to sit back and relax the whole weekend! We made about 240 contacts all up. Some impressive distances too - 2014 km on 6 m, 598 km on 2 m and 70 cm, 518 km on 23 cm and 33 km on 2.4 and 3.4 GHz (with 300 micro-watts!). The duct which allowed such good propagation up the NSW coast was clearly visible from our location.

Things didn't go quite so smoothly for Doug VK4OE: I'm sure I'll do better another time, due to a number of 'challenges' of field operation that were experienced. I could describe:

- forgetting to pack my main 2.4 GHz antenna for my Saturday evening operations (I knew I should load it, but it was missed at the last minute!)

- light rain all Sunday morning at my location on Springbrook Mountain, high on the NSW-Qld border, inland from the Gold Coast. With the wisdom of hindsight, a different location would have been better - it wasn't raining anywhere else.

- having completed and tested a new 10 GHz transverter in the week before the contest, my previously-reliable other 10 GHz unit chose this time to develop a fault that made 3 cm QSO's very difficult.

- rather flat propagation in this part of the country during the times I was operating, and not as many stations operating as in previous events.

- and finally, my 'rover' comrade Alan VK4UAT encountered an unexpected blocked-off road on the Sunday morning at one point and, after having to drive an extra 50 km or so, did not get set up in his final grid square in time to make all the contacts we could before 0100z, which was to include 12 cm and 3 cm.

- And, would you believe, that despite trying and despite the Gold Coast being a high population area, I failed to work any other station in QG61 square on 2 metres! [Also, unusually, not one VK2, either....]

Such is the 'fun' of field operation in contests! Nevertheless, I was grateful for the support that I received from many VK4's and I am looking forward to next year's event already!

### **Aircraft-Enhanced Propagation**

Ron VK3AFW writes about his efforts in working a distant, and rare, gridsquare via aircraft-enhanced propagation.

*This is for those of you interested in AE working on different paths but have limited experience in doing this. Recently I worked Barry VK3BJM/P near Broken Hill on 2 m, a distance a bit over 700 km. The normal tropospheric propagation wasn't helpful, as although Barry could frequently hear my CW, I could not copy his SSB although snatches of audio were heard in the noise from time to time. Following a contact between David VK3HZ and Barry on 70 cm that was clearly via AE, Barry and I decided to get serious about the QSO. Examination of the airline timetables showed that a Sydney to Adelaide flight would have been the likely enhancer for the 70 cm QSO, so the next available similar flight was found.*

*My rough prediction was signals commencing 30 minutes after the scheduled departure, based on the 70 cm QSO. Subsequent better calculations give roughly 40 minutes, based on flight times and path geometry.*

*After a phone conversation, Barry set up his keyer, calling CQ with breaks commencing 25 minutes after published departure. About 41 minutes after scheduled departure of the Adelaide flight, Barry's CW signal suddenly rose out of*

the noise to 529. I waited for the sequence to finish and then quickly called Barry on SSB giving his report. He responded with my report and acknowledgement of his. I confirmed receiving his report but by then signals were fading. A couple more quick exchanges and signals were gone.

The total window was about 20 seconds, (as it was for the 70 cm QSO) during which the aircraft travelled less than 5 km!

Lessons for all:

It is possible to predict times of AE openings from the published timetables and basic geometry. Allow some tolerance for variable flight conditions and gate delays.

Available contact times may be short. Fast SSB exchanges are preferable although good CW operation can allow completion. (I missed a previous QSO with Barry on another outing through my clumsy CW procedure.)

Having one station run a keyer or recorded calling message with listening breaks every 5 or so seconds helps considerably.

Barry was using 100 w to a 10 ele yagi so it isn't necessary to have a semitrailer full of gear to mount an expedition.

## Beacons

Alan VK3XPD advises that a new beacon - VK3RXX – is now up and running on 2403.530 MHz. The beacon is located in Melbourne – QF22le. Power is 16 watts into an Alford Slot up about 13 metres. Ident is CW. It is currently about 1 KHz low and slowly drifting down. There is phase noise on the signal - it sounds a bit raspy/scratchy - but this will be improved shortly. The beacon has already been heard in Ballarat. Alan is looking for more signal reports - [alandevlin@bigpond.com](mailto:alandevlin@bigpond.com).

## Annual Gridsquare Table 2006 Results

Final results are in and the table has been closed off for the AGT 2006 competition.

The AGT competition was created by Adam VK4CP to stimulate more activity on our VHF/UHF bands. The rules are similar to that of the Gridsquare League Table, where entrants record the number of gridsquares worked on the VHF, UHF and microwave bands. The main difference is that the competition runs from 0000Z each year when the slate is wiped clean, making everybody start on a level playing field annually.

Congratulations to Leigh VK2KRR who managed to work 133 gridsquares on the bands from 50 MHz to 24 GHz. A total of 53 operators submitted scores for 2006. The top 10 scores are shown in the table below:

Operator Details		Terrestrial Contacts					EME		Total
Callsign	Name	50	144	432	1296	10G	144	432	Squares
VK2KRR	Leigh	29	44	24	8	-	26	2	133
VK4WS	Wayne	51	40	5	2	-	25	1	124
VK5UBC	Brian	60	37	21	1	-	-	-	119
VK4ABW	Gary	71	10	3	-	-	21	1	106
VK7AC	Norman	45	41	8	8	-	-	-	102
VK5AKK	Phil	25	37	23	11	-	-	-	96
VK3UH	Len	39	26	15	8	2	-	-	90

ZL3TY	Bob	-	14	-	-	-	70	-	84
VK4ZQ	Roy	40	20	12	5	-	-	-	77
VK3AAK	Michael	30	27	15	4	-	-	-	76

Full details of the results may be found at [www.vklogger.com/agt](http://www.vklogger.com/agt)

The 2007 competition is in full swing, with the current top score at 83. It's not too late to enter (63 people have already). Go to [www.vklogger.com/agt2007](http://www.vklogger.com/agt2007) and enter your current gridsquare counts to join in on the fun.

## VK/ZL Logger Enhancements

I seem to write regularly about the VK/ZL Propagation Logger, and for good reason. Not only is it proving to be a very valuable resource for the VHF/UHF operator, but it is also being continually improved with new functions being added by Adam VK4CP on an almost daily basis (only slight exaggeration there).

One of the latest significant enhancements is the addition of a Spot facility where notable QSO's or beacon reports can be entered. A map, courtesy of Google Maps, is displayed in the top corner of the page showing the paths of recent Spots. The example below is from 3 February when VK6RST was being heard in VK3 and VK5, VK7's were working VK3's and ZL1IU was hearing the VK3RGI beacon and working into VK2.



## ACMA To The Rescue

Sometimes people complain that the ACMA is very willing to take our license fees, but then treats us as "self-regulating" and is reluctant to provide any assistance when it is the amateur that suffers from interference problems. Alan VK3XPD sent in this report of his very positive dealings with the ACMA when he had a severe interference problem on 2 metres.

*Recently I noticed the sudden appearance of an unusual S9+ "Birdie/Interference" on and around 144.100 MHz - the 2 metre SSB Call Frequency. The interfering signal was loudest when beaming at Adelaide from my QTH in Camberwell, Melbourne, so that was the end of any "weak signal" QSO's until the problem either cleared itself (as*

*is normal) or the interfering source was located and eliminated.*

*After 3 days of enduring the problem for 24/7, I was becoming a bit desperate. The Interference was moving up and down the band. I asked a few nearby amateurs to take a listen, but nothing heard. So it had to be close-by and rather weak in nature.*

*Finally, I decided to access the Australia Communications Management Authority (ACMA) website. However, in today's de-regulated communications environment I was not confident that an Amateur Radio enthusiast lodging an interference complaint would elicit any action. We are, after all, not part of the commercial world and, to a great degree, we are indeed self-regulated.*

*I rang the ACMA Interference Hotline and started to discuss the interference I was experiencing only to be cut short by: "I'm not technical - you will have to lodge your complaint by email". This I did with plenty of detail in the hope of getting some action.*

*A week passed ... nothing. The Interference was still there & still agile. I followed up with another complaint. A week later and still no action. I was beginning to look at my alternate options when there was a knock at the door and an unexpected visit by ACMA officer - Peter Tapai.*

*I showed him the nature of the interference and it's direction and I guess he surreptitiously looked about my station/gear to ensure that I was not the cause of the Interference.*

*On his way out to investigate further, I happened to ask.. "What will you be using to locate this problem" ? I was rather taken aback by his response.. An old R7000 general coverage receiver. And the antenna I asked ? Oh, just a vertical he replied.*

*So off he trotted in the direction of the Interference.*

*Not 30 minutes later, he returned with good news. It turns out the offending interference was located at the rear of a house some 3 kilometres to the north west of this QTH. The cause - an unstable general-purpose amplifier attached to some "rabbit ears" feeding an FM Tuner. The owner had just returned from the UK & fitted this amplifier to improve his FM reception.*

*My sincere thanks must go to the ACMA's - Mr Peter Tapai for his efforts in assisting this Amateur.*

Please send any Weak Signal reports to David VK3HZ

## **Digital DX Modes**

Rex Moncur – VK7MO

In the normal arrangement for JT65, WSJT is set up to run a QSO in EME format with the OOO report. For terrestrial contacts it is generally required that a report include at least 2 unknown characters. In VK, it is a requirement for record claims and most VHF contests to send at least two characters of unknown information. WSJT makes provision for sending two character reports based on the dB level of the signal in the range -01 to -30 dB. These dB level reports are sent in place of the grid square and can be typed over the standard EME message in any line, but it is usually easier to use the first line. WSJT also makes provision to send Rogers (RRR) and 73 in conjunction with both callsigns in this way. Whether you send RRR or 73 in conjunction with callsigns or in short-hand form is a matter of choice as both methods give a very high level of QSO integrity – providing the short hand method is supported by clear evidence of two tones on the waterfall. An example of a terrestrial QSO using JT65 is as follows:

CQ VK3II  
VK3II VK2DAG -23  
VK2DAG VK3II R-21  
VK3II VK2DAG RRR  
VK2DAG VK3II 73

The last line with 73 is useful only to tell the other operator that the QSO is completed and is not in itself an essential element of a valid QSO.

The dB format reporting system requires close adherence to the correct format to ensure it is correctly sent. For example if you put an extra space in front of the signal report or send reports outside the range -01 to -30 or leave in say part of the grid locator, this will all lead to sending something other than what you intended. You must send the signal report as the two numerals (e.g. -01 rather than -1) to have it sent correctly. Another restriction is that it is not possible to combine the EME OOO report with a dB report, which is a good reason to always use the first line to prepare your terrestrial messages. The easy way to check what is being sent is to look at the transmitted message that appears at the bottom right hand corner of the WSJT window at the time of transmission. It is wise to get into the habit of checking what is being sent each time you send a message when using the terrestrial format.

WSJT measures the signal level by looking for the level of the sync tone, which has a particular format that does not occur when using shorthand messages. Thus WSJT will not give accurate measurements of signal level on shorthand messages and these should be avoided if you are for example using WSJT for propagation studies.

Please send any Digital DX Modes reports to Rex VK7MO

## The Magic Band – 6 m DX

Brian Cleland – VK5BC

Good Sporadic E conditions continued through January and into early February. Although the number of active stations decreased in January, the band continued to open on most days - I guess a lot of operators were back at work.

In VK5 openings were recorded at my QTH on the following days in January;

2nd	ZL, VK2, VK1
3rd	VK4
4th	VK6
5th	VK8 (Alice Springs)
6th	ZL, VK2, VK7
7th	ZL, VK1, VK2, VK3, VK4, VK5 (Mt Gambier), VK6, VK8
8th	VK8 (Darwin)
11th	ZL, VK2, VK4, VK7
12th	ZL, VK3
13th	VK2
14th	VK6, VK7
15th	VK2, VK3, VK6
16th	VK3, VK4, VK6
17th	VK2, VK4
18th	VK4
19th	ZL, VK1, VK2, VK3, VK4
20th	VK2, VK4, VK8 (Darwin & Alice Springs)
21st	VK4
23rd	VK4, VK6
24th	ZL, VK2, VK4, VK6

25th	VK4
26th	VK6
27th	VK2
28th	VK4, VK6
30th	VK6
31st	VK4

One of the more interesting contacts this season was with Wayne VK6JR operating portable from the balcony of a hotel in Kalgoorlie. Wayne was using a vertical strapped to the balcony rail and using an IC706 Mk 2 at about 30w on a Gel Cell battery. He was 5/9 into VK5 and also managed to work some VK4's.

Other than the many ZL openings there has been no international activity except for a brief opening to JA from VK5 on January 20th with weak JA signals being heard in Adelaide. The only contact made though was between Col VK5RO and a JA1 on CW.

This summer sporadic E season has been one of the best with high activity from all states. Notably there has been good activity from VK8 (both Alice Springs and Darwin) as well as higher activity from far Northern Queensland (Cairns area). Also VK7 has been well represented from both the Hobart area and the Northern coastline. Other notable features have been the high number of openings to New Zealand and the regular VK6 openings to the eastern states and ZL. On the downside has been the lack of activity from New Caledonia. The FK8 beacon has been regularly heard from all states but I have only received one report from Brad VK2GWB of a contact with FK8GB on the 7th January.

Received a note from Tony P29AJ who says he has been hearing VK's on 6m on his IC706 using a long wire antenna. He is in the process of getting a tuner to cover 6m but if he can raise enough aluminium tubing will build a small yagi. If you can help Tony his email is [service@prosec.com.pg](mailto:service@prosec.com.pg). Certainly would be good to have a P29 active on 6m.

One big enhancement to 6m operating this season has been the introduction of a 6m logger produced by Adam VK4CP. This allowed 6 m information to be logged separately from the existing V/UHF logger. The logger has many features including operator and beacon information and allows you to spot beacons, stations etc with the logger then pictorially displaying the spots on a map so that with a glance of the map you can see where the band is open. The logger can be found at:

[www.vklogger.com/50logger](http://www.vklogger.com/50logger).

Good work Adam.

Please remember to send any 6 m information to Brian VK5BC